

REMARKS

I. STATUS OF THE CLAIMS

Claims 1-4 and 8-11 are currently pending.

II. REJECTION OF CLAIMS 1-4 AND 8-11 UNDER 35 USC 102(B)
AS BEING ANTICIPATED DIGIOVANNI, USP 5,406,404

The present invention as recited, for example, in claim 3, relates to an optical amplifier with a configuration to amplify a WDM optical signal with substantially equal gain over the wavelengths of the optical signals in the WDM optical signal. The optical amplifier includes (a) a first-stage optical amplifier which amplifies the WDM optical signal, (b) a level controller which controls a power level of the WDM optical signal amplified by the first-stage optical amplifier, and (c) a second-stage optical amplifier which amplifies the WDM optical signal of which level is controlled by the level controller.

As noted by the Examiner, column 1, lines 6-20 and 63-68; column 2, lines 2-6 and 30-34; and column 4, lines 12-18, of DiGiovanni, indicate that the invention of DiGiovanni can be used in a WDM system. However, the invention of DiGiovanni is directed to mitigating gain peaks *in a chain of fiber amplifiers*, by controlling the pump light provided to the amplifiers. See, for example, the Abstract; column 2, lines 29-40, of DiGiovanni.

Therefore, DiGiovanni relates to *pump control of a chain of amplifiers*.

It is respectfully submitted that no portion of DiGiovanni discloses an optical amplifier with a level controller operating with first-stage and second-stage optical amplifiers, and amplifying a WDM optical signal with substantially equal gain over wavelengths, as recited, for example, in claim 3.

The Examiner rejects the claims largely over the system disclosed in FIG. 1A of DiGiovanni. However, it is respectfully submitted that the system in FIG. 1A of DiGiovanni is not a WDM system, and is instead simply an experimental test system for testing the invention of DiGiovanni in controlling pump light of a chain of amplifiers.

For example, column 3, lines 36-45, of DiGiovanni, disclose that:

"The fiber laser wavelength was varied from 1540 nm to 1562 nm in two nm steps. For each fiber laser wavelength, spectra of the output of each amplifier were taken from which both

the output power and the optical SNR, the ratio of the signal to ASE in a 0.1 nm bandwidth, were measured. FIG. 3 shows the superposition of all the spectra taken after the fourth amplifier in chain. Each individual spectrum occupies 5 nm."

Therefore, the spectra in FIG. 3 of DiGiovanni is not that of a WDM light, but is instead the superposition of individual spectrum obtained by varying the laser wavelength in steps.

For example, in FIG. 1A of DiGiovanni, a fiber laser does not output all the lights having spectra shown in FIG. 2 at the same time, but outputs only a single light having a tuned wavelength in a range of 1540 nm to 1562 nm. In other words, in FIG. 1A of DiGiovanni, each amplifier does not amplify a WDM optical signal which includes a plurality of optical signals with different wavelengths, but simply amplifies a single optical signal.

Moreover, the variable attenuators 2 in FIG. 1A of DiGiovanni are used in a substantially different manner than the level controllers recited, for example, in claim 3. For example, as indicated in column 3, lines 21-36, of DiGiovanni, variable attenuators 2 are simply used to represent fiber or splitting loss in the test system of FIG. 1A. These attenuators of DiGiovanni are NOT used in an optical amplifier having a first-stage and a second-stage to amplify a WDM optical signal with substantially equal gain over wavelengths as recited, for example, in claim 3. Moreover, these attenuators of DiGiovanni are NOT used as variable optical attenuators in the manner recited, for example, in dependent claims 8-11.

In view of the above, it is respectfully submitted that the rejection is overcome.

III. NUMBER OF REFERENCES CITED

In item 5 on page 2 of the Office Action, the Examiner notes that an exceptionally large number of references have been cited in this application, and requests that a statement of relevancy be provided for each reference.

This application claims the benefit of several other applications in the chain of prosecution. Many references were cited in the prior applications in the chain of prosecution, and were again cited in the present application to carry these references forward. In addition, other references were cited to ensure that the applicant has met the duty of disclosure over the relatively long prosecution history of the chain of prosecution dating back to 1996. Therefore, although the Examiner requests that a statement of the relevancy be provided for each reference, it is respectfully submitted that such a statement is not necessary.

The applicants greatly appreciate the Examiner efforts in examining the application and references.

IV. CONCLUSION

In view of the above, it is respectfully submitted that the application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

If any further fees are required in connection with the filing of this response, please charge such fees to our Deposit Account No. 19-3935.

Respectfully submitted,
STAAS & HALSEY LLP

Date: February 9, 2004

By: 
Paul I. Kravetz
Registration No. 35,230

700 Eleventh Street, NW, Suite 500
Washington, D.C. 20001
(202) 434-1500